10088452 10/088452
JC05 Rec'd PCT/PTO 14 MAR 2002

Practitioner's Docket No. 915-003.5

CHAPTER II

Preliminary Classification:
Proposed Class:
Subclass:
NOTE: *"All applicants are requested to include a preliminary classification on newly filed patent applications. The preliminary classification, preferably class and subclass designations, should be identified in the upper right-hand corner of the letter of transmittal accompanying the application papers, for example 'Proposed Class 2, subclass 129.'" M.P.E.P., § 601, 7th ed.*

TRANSMITTAL LETTER TO THE UNITED STATES ELECTED OFFICE (EO/US)

(ENTRY INTO U.S. NATIONAL PHASE UNDER CHAPTER II)

PCT/EP00/09100 — INTERNATIONAL APPLICATION NO
13 September 2000 — INTERNATIONAL FILING DATE
14 September 1999 — PRIORITY DATE CLAIMED

Relocation in a Communication System
TITLE OF INVENTION

Kalle AHMAVAARA
APPLICANT(S)

BOX PCT
U.S. PATENT AND TRADEMARK OFFICE
P.O. BOX 2327
ARLINGTON, VA 22202
ATTN: EO/US

CERTIFICATION UNDER 37 C.F.R. § 1.10*
*(Express Mail label number is **mandatory**.)*
(Express Mail certification is optional.)

I hereby certify that this Transmittal Letter and the papers indicated as being transmitted therewith is being deposited with the United States Postal Service on this date March 14, 2002, in an envelope as "Express Mail Post Office to Addressee" Mailing Label Number EV005525645US, addressed to the: Assistant Commissioner for Patents.

Nancy Guth
(type or print name of person mailing paper)

Nancy Guth
Signature of person mailing paper

WARNING: *Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. § 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.*

***WARNING:** Each paper or fee filed by "Express Mail" **must** have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. § 1.10(b).*
*"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.*

NOTE: To avoid abandonment of the application, the applicant shall furnish to the USPTO, not later than 20 months from the priority date: (1) a copy of the international application, unless it has been previously communicated by the International Bureau or unless it was originally filed in the USPTO; and (2) the basic national fee (see 37 C.F.R. § 1.492(a)). The 30-month time limit may not be extended. 37 C.F.R. § 1.495.

***WARNING:** Where the items are those which can be submitted to complete the entry of the international application into the national phase are subsequent to 30 months from the priority date the application is still considered to be in the international state and if mailing procedures are utilized to obtain a date the express mail procedure of 37 C.F.R. § 1.10 must be used (since international application papers are not covered by an ordinary certificate of mailing—See 37 C.F.R. § 1.8.*

NOTE: Documents and fees must be clearly identified as a submission to enter the national state under 35 U.S.C. § 371 otherwise the submission will be considered as being made under 35 U.S.C. § 111. 37 C.F.R. § 1.494(f).

I. Applicant herewith submits to the United States Elected Office (EO/US) the following items under 35 U.S.C. § 371:

a. ☒ This express request to immediately begin national examination procedures (35 U.S.C. § 371(f)).

b. ☒ The U.S. National Fee (35 U.S.C. § 371(c)(1)) and other fees (37 C.F.R. § 1.492) as indicated below:

2. Fees

CLAIMS FEE	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
☒*	TOTAL CLAIMS	28 -20=	8	× $18.00=	$ 144.00
	INDEPENDENT CLAIMS	4 -3=	1	× $ 84.00	84.00
	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $260.00	
BASIC FEE**	☐ U.S. PTO WAS INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where an International preliminary examination fee as set forth in § 1.482 has been paid on the international application to the U.S. PTO: ☐ and the international preliminary examination report states that the criteria of novelty, inventive step (non-obviousness) and industrial activity, as defined in PCT Article 33(1) to (4) have been satisfied for all the claims presented in the application entering the national stage (37 C.F.R. § 1.492(a)(4)) ..... $100 ☐ and the above requirements are not met (37 C.F.R. § 1.492(a)(1)) ..... $710 ☒ U.S. PTO WAS NOT INTERNATIONAL PRELIMINARY EXAMINATION AUTHORITY Where no international preliminary examination fee as set forth in § 1.482 has been paid to the U.S. PTO, and payment of an international search fee as set forth in § 1.445(a)(2) to the U.S. PTO: ☐ has been paid (37 C.F.R. § 1.492(a)(2)) ..... $740 ☐ has not been paid (37 C.F.R. § 1.492(a)(3)) ..... $1040 ☒ where a search report on the international application has been prepared by the European Patent Office or the Japanese Patent Office (37 C.F.R. § 1.492(a)(5)) $890				890.00
	Total of above Calculations				= 1118.00
SMALL ENTITY	Reduction by 1/2 for filing by small entity, if applicable. Affidavit must be filed also. (note 37 C.F.R. § 1.9, 1.27, 1.28)				–
	Subtotal				
	Total National Fee				$1118.00
	Fee for recording the enclosed assignment document $40.00 (37 C.F.R. § 1.21(h)). (See Item 13 below). See attached "ASSIGNMENT COVER SHEET".				
TOTAL	Total Fees enclosed				$1118.00

*See attached Preliminary Amendment Reducing the Number of Claims.

i. ☒ A check in the amount of $1118.00 to cover the above fees is enclosed.

ii. ☐ Please charge Account No. _____ in the amount of $ _____. A duplicate copy of this sheet is enclosed.

**WARNING: *"To avoid abandonment of the application the applicant shall furnish to the United States Patent and Trademark Office not later than the expiration of 30 months from the priority date: * * * (2) the basic national fee (see § 1.492(a)). The 30-month time limit may not be extended." 37 C.F.R. § 1.495(b).*

WARNING: *If the translation of the international application and/or the oath or declaration have not been submitted by the applicant within thirty (30) months from the priority date, such requirements may be met within a time period set by the Office. 37 C.F.R. § 1.495(b)(2). The payment of the surcharge set forth in § 1.492(e) is required as a condition for accepting the oath or declaration later than thirty (30) months after the priority date. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than thirty (30) months after the priority date. Failure to comply with these requirements will result in abandonment of the application. The provisions of § 1.136 apply to the period which is set. Notice of Jan. 3, 1993, 1147 O.G. 29 to 40.*

3. ☒ A copy of the International application as filed (35 U.S.C. § 371(c)(2)):

NOTE: *Section 1.495 (b) was amended to require that the basic national fee and a copy of the international application must be filed with the Office by 30 months from the priority date to avoid abandonment. "The International Bureau normally provides the copy of the international application to the Office in accordance with PCT Article 20. At the same time, the International Bureau notifies applicant of the communication to the Office. In accordance with PCT Rule 47.1, that notice shall be accepted by all designated offices as conclusive evidence that the communication has duly taken place. Thus, if the applicant desires to enter the national stage, the applicant normally need only check to be sure the notice from the International Bureau has been received and then pay the basic national fee by 30 months from the priority date." Notice of Jan. 7, 1993, 1147 O.G. 29 to 40, at 35-36. See item 14c below.*

a. ☐ is transmitted herewith.

b. ☐ is not required, as the application was filed with the United States Receiving Office.

c. ☒ has been transmitted

i. ☒ by the International Bureau.
Date of mailing of the application (from form PCT/1B/308): 22 March 2001

ii. ☐ by applicant on _____.
Date

4. ☒ A translation of the International application into the English language (35 U.S.C. § 371(c)(2)):

a. ☐ is transmitted herewith.

b. ☒ is not required as the application was filed in English.

c. ☐ was previously transmitted by applicant on _____.
Date

d. ☐ will follow.

5. ☒ Amendments to the claims of the International application under PCT Article 19 (35 U.S.C. § 371(c)(3)):

NOTE: *The Notice of January 7, 1993 points out that 37 C.F.R. § 1.495(a) was amended to clarify the existing and continuing practice that PCT Article 19 amendments must be submitted by 30 months from the priority date and this deadline may not be extended. The Notice further advises that: "The failure to do so will not result in loss of the subject matter of the PCT Article 19 amendments. Applicant may submit that subject matter in a preliminary amendment filed under section 1.121. In many cases, filing an amendment under section 1.121 is preferable since grammatical or idiomatic errors may be corrected." 1147 O.G. 29-40, at 36.*

a. ☐ are transmitted herewith.

b. ☐ have been transmitted

i. ☐ by the International Bureau.
Date of mailing of the amendment (from form PCT/1B/308): _____

ii. ☐ by applicant on (date) _____.
Date

c. ☒ have not been transmitted as

i. ☒ applicant chose not to make amendments under PCT Article 19.
Date of mailing of Search Report (from form PCT/ISA/210.): 12 December 2000

ii. ☐ the time limit for the submission of amendments has not yet expired. The amendments or a statement that amendments have not been made will be transmitted before the expiration of the time limit under PCT Rule 46.1.

6. ☒ A translation of the amendments to the claims under PCT Article 19 (38 U.S.C. § 371(c)(3)):

a. ☐ is transmitted herewith.

b. ☐ is not required as the amendments were made in the English language.

c. ☒ has not been transmitted for reasons indicated at point 5(c) above.

7. ☒ A copy of the international examination report (PCT/IPEA/409)

☒ is transmitted herewith.

☐ is not required as the application was filed with the United States Receiving Office.

8. ☒ Annex(es) to the international preliminary examination report

a. ☒ is/are transmitted herewith.

b. ☐ is/are not required as the application was filed with the United States Receiving Office.

9. ☒ A translation of the annexes to the international preliminary examination report

a. ☐ is transmitted herewith.

b. ☒ is not required as the annexes are in the English language.

10. ☒ An oath or declaration of the inventor (35 U.S.C. § 371(c)(4)) complying with 35 U.S.C. § 115

a. ☐ was previously submitted by applicant on _____ Date

b. ☐ is submitted herewith, and such oath or declaration

i. ☐ is attached to the application.

ii. ☐ identifies the application and any amendments under PCT Article 19 that were transmitted as stated in points 3(b) or 3(c) and 5(b); and states that they were reviewed by the inventor as required by 37 C.F.R. § 1.70.

iii. ☒ will follow.

II. Other document(s) or information included:

11. ☒ An International Search Report (PCT/ISA/210) or Declaration under PCT Article 17(2)(a):

a. ☐ is transmitted herewith.

b. ☒ has been transmitted by the International Bureau.
Date of mailing (from form PCT/IB/308): 22 March 2001

c. ☐ is not required, as the application was searched by the United States International Searching Authority.

d. ☐ will be transmitted promptly upon request.

e. ☐ has been submitted by applicant on _____ Date

12. ☒ An Information Disclosure Statement under 37 C.F.R. §§ 1.97 and 1.98:

a. ☒ is transmitted herewith.

Also transmitted herewith is/are:

☒ Form PTO-1449 (PTO/SB/08A and 08B).

☒ Copies of citations listed.

b. ☐ will be transmitted within THREE MONTHS of the date of submission of requirements under 35 U.S.C. § 371(c).

c. ☐ was previously submitted by applicant on _____ Date

13. ☐ An assignment document is transmitted herewith for recording.

A separate ☐ "COVER SHEET FOR ASSIGNMENT (DOCUMENT) ACCOMPANYING NEW PATENT APPLICATION" or ☐ FORM PTO 1595 is also attached.

_____

_____

_____

14. ☒ Additional documents:
    a. ☐ Copy of request (PCT/RO/101)
    b. ☒ International Publication No. WO 01/20938 A1
        i. ☒ Specification, claims and drawing
        ii. ☐ Front page only
    c. ☒ Preliminary amendment (37 C.F.R. § 1.121)
    d. ☐ Other

15. ☒ The above checked items are being transmitted
    a. ☒ before 30 months from any claimed priority date.
    b. ☐ after 30 months.

16. ☐ Certain requirements under 35 U.S.C. § 371 were previously submitted by the applicant on _____, namely:

AUTHORIZATION TO CHARGE ADDITIONAL FEES

WARNING: *Accurately count claims, especially multiple dependant claims, to avoid unexpected high charges if extra claims are authorized.*

NOTE: "A written request may be submitted in an application that is an authorization to treat any concurrent or future reply, requiring a petition for an extension of time under this paragraph for its timely submission, as incorporating a petition for extension of time for the appropriate length of time. An authorization to charge all required fees, fees under § 1.17, or all required extension of time fees will be treated as a constructive petition for an extension of time in any concurrent or future reply requiring a petition for an extension of time under this paragraph for its timely submission. Submission of the fee set forth in § 1.17(a) will also be treated as a constructive petition for an extension of time in any concurrent reply requiring a petition for an extension of time under this paragraph for its timely submission." 37 C.F.R. § 1.136(a)(3).

NOTE: "Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

/ ☒ The Commissioner is hereby authorized to charge the following additional fees that may be required by this paper and during the entire pendency of this application to Account No. 23-0442.

☒ 37 C.F.R. § 1.492(a)(1), (2), (3), and (4) (filing fees)

WARNING: *Because failure to pay the national fee within 30 months without extension (37 C.F.R. § 1.495(b)(2)) results in abandonment of the application, it would be best to always check the above box.*

10/088452
JC13 Rec'd PCT/PTO 14 MAR 2002

☐ 37 C.F.R. § 1.492(b), (c) and (d) (presentation of extra claims)

NOTE: Because additional fees for excess or multiple dependent claims not paid on filing or on later presentation must only be paid or these claims cancelled by amendment prior to the expiration of the time period set for response by the PTO in any notice of fee deficiency (37 C.F.R. § 1.492(d)), it might be best not to authorize the PTO to charge additional claim fees, except possible when dealing with amendments after final action.

☐ 37 C.F.R. § 1.17 (application processing fees)

☐ 37 C.F.R. § 1.17(a)(1)–(5) (extension fees pursuant to § 1.136(a).

☐ 37 C.F.R. § 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. § 1.311(b))

NOTE: Where an authorization to charge the issue fee to a deposit account has been filed before the mailing of a Notice of Allowance, the issue fee will be automatically charged to the deposit account at the time of mailing the notice of allowance. 37 C.F.R. § 1.311(b).

NOTE: 37 C.F.R. § 1.28(b) requires "Notification of any change in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying . . . issue fee." From the wording of 37 C.F.R. § 1.28(b): (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

☐ 37 C.F.R. § 1.492(e) and (f) (surcharge fees for filing the declaration and/or filing an English translation of an International Application later than 30 months after the priority date).

SIGNATURE OF PRACTITIONER

Reg. No.: 27,550

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Alfred A. Fressola
(type or print name of practitioner)
WARE, FRESSOLA, VAN DER SLUYS & ADOLPHSON LLP
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10088452 .10/088452
JC13 Rec'd PCT/PTO 14 MAR 2002

PATENT
915-003.5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the matter of: Ahmavaara	)	
	)	
Serial No:	)	Group Art Unit
	)	Examiner:
Filed: Herewith	)	
	)	
International Application No: PCT/EP00/09100	)	
	)	
International Filing Date: September 13, 2000	)	
	)	
For: Relocation in a Communication System	)	

ASSISTANT COMMISSIONER OF PATENTS
WASHINGTON, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Please preliminarily amend the above-referenced application as follows:

In the Specification:

At page 1, prior to line 3, please insert a new heading and text as follows:

--CROSS-REFERENCE TO RELATED APPLICATIONS

Priority is claimed from International Application PCT/EP00/09100 filed 13 September 2000, which in turn claims priority from Great Britain application GB 9921706.9 filed 14 September 1999.--

Express Mail No. EV 005525645US

Please replace the paragraph beginning at page 3, line 10 with the following rewritten paragraph:

--In case of an active i.e. ongoing connection, one of the features that should be relocated is the state of a protocol termination point. Although it is not always necessary, in a usual case the status of the protocol termination point at the new "replacing" network element or node should be such that it may take over the functions of the old "replaced" network node. At the present the parameters which need to be transferred have to be defined also in the protocols which are used to convey the information from the old termination point to the new termination point. For example, if parameters of a Radio Resource Control (RRC) or Medium Access Control (MAC) or Radio Link Control (RLC) protocols are to be relocated in a system that would use radio network subsystem application part (RNSAP) for communication between the network controller nodes, this would mean that a lot of "external" parameters would have to be defined for the RNSAP. This would increase the complexity of the RNSAP. In addition, if several additional parameters of a protocol are to be defined for another protocol, it makes these two different protocols very dependent on each other. The independent evolution of them would thus become more difficult to manage.--

Please replace the paragraph beginning at page 16, line 9 with the following rewritten paragraph:

--According to a further embodiment the initialization is a bi-directional process. In other words, instead of only transmitting information from the first network element (node) to the second element, the new network element may send a response to the first element or accomplish a transmission to a further network element. The response may include a message such as "unable to initialize", "overload", "all parameters not received" and so on. Upon receiving the response, the first network element may modify its state and/or take some other actions towards the new termination point. For example, transmit modified parameter or parameters, or use a different transmission route, or try to relocate the connection to another network element.--

Please replace the paragraph beginning at page 16, line 31 through page 17, line 4 with the following rewritten paragraph:

--There are also other possible reasons for initiating the relocation procedure other than movement of the mobile station into a new service area. For example, the network element in question may become overloaded or a failure in the system of the network element itself may force the system to relocate at least a part of the functionalities; for purposes of network optimization; for purposes of load balancing, and so on.--

In the Claims:

Claims 3, 5-7, 9, 11-16, 19-22 and 25-26 have been amended.

3. (Amended) A method according to claim 1, wherein the first termination point is located at a first network element of the communication system and the second termination point is located at a second network element of the communication system.

5. (Amended) A method according to claim 1, wherein the protocol initialization unit is encapsulated in a message transmitted between the first termination point and the second termination point by the second protocol.

6. (Amended) A method according to claim 1, wherein the protocol initialization unit is transparent for the second protocol.

7. (Amended) A method according to claim 1, wherein the protocol initialization unit is transmitted via a third network element between the termination points.

9. (Amended) A method according to claim 1, wherein the protocol initialization unit is transmitted by a direct connection between the termination points.

11. (Amended) A method according to claim 1, wherein the predefined information of the first protocol comprise one or several parameters of a radio resource control protocol (RRC), medium access control protocol (MAC), radio link control protocol (RLC), and/or packet data convergence protocol (PDCP).

12. (Amended) A method according to claim 1, wherein the protocol initialization unit contains information of at least one further protocol.

13. (Amended) A method according to claim 1, comprising steps of:

defining at least one further protocol initialization unit containing predefined information of a further protocol by the further protocol; and

transferring the further protocol initialization unit from the first termination point to the second termination point.

14. (Amended) A method according to claim 13, wherein the further protocol initialization unit is transferred between the termination points by a protocol that is different from the second protocol.

15. (Amended) A method according to claim 1, wherein at least one of the termination points is located at one of the following: a base station controller, a radio network controller, a base station, a gateway.

16. (Amended) A method according to claim 1, wherein the step of initializing the second termination point comprises setting the parameters of the second termination point into a state that is similar to the parameters of the first termination point before or at the time the relocation procedure was initiated.

19. (Amended) A communication system according to claim 17, wherein the control means for relocating are arranged to encapsulate the protocol initialization unit into a message to be transmitted from the first termination point to the second termination point.

20. (Amended) A communication system according to claim 17, wherein the first termination point is located at a first network element of the communication system and the control means for relocating are arranged in connection with the first network element.

21. (Amended) A communication system according to claim 17, wherein the second termination point is located at a second network element of the communication system and the control means for initializing are arranged in connection with the second network element.

22. (Amended) A communication system according to claim 17, wherein the protocol initialization unit contains information of at least one further protocol.

25. (Amended) A network element according to claim 23, wherein the control means for relocating are arranged to encapsulate the protocol initialization unit into a message to be transmitted from the first termination point by means of the second protocol.

26. (Amended) A network element according to claim 23, wherein the protocol initialization unit contains information of at least one further protocol.

In the Abstract:

After the claim page 23, please insert a new page with the following:

--Abstract of the Disclosure

The present invention relates to relocation of a protocol termination point in a communication system comprising a first protocol termination point, a second protocol termination point and control means for relocating a first protocol from the first protocol termination point to the second protocol termination point. A protocol initialization unit that contains predefined information of the first termination point is defined by means of the first protocol. The protocol initialization unit is subsequently transferred from the first termination point to the second termination point by means of a second protocol. The second termination point is initialized based on the received protocol initialization unit.--

915-003.5

Remarks

This preliminary amendment is filed for the purpose of placing the application into standard U.S. format and to correct any grammatical errors. Claims 3, 5-7, 9, 11-16, 19-22 and 25-26 have been amended. Consideration and allowance of the claims is earnestly solicited.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

Respectfully submitted,

Date: 3/14/02

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AAF/aks

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10/088452
531 Rec'd PCT/PT 14 MAR 2002

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Paragraph beginning at page 3, line 10 has been amended as follows:

In case of an active i.e. ongoing connection, one of the features that should [to] be relocated is the state of a protocol termination point. Although it is not always necessary, in a usual case the status of the protocol termination point at the new "replacing" network element or node should be such that it may take over the functions of the old "replaced" network node. At the present the parameters which need to be transferred have to be defined also in the protocols which are used to convey the information from the old termination point to the new termination point. For example, if parameters of a Radio Resource Control (RRC) or Medium Access Control (MAC) or Radio Link Control (RLC) protocols are to be relocated in a system that would use radio network subsystem application part (RNSAP) for communication between the network controller nodes, this would mean that a lot of "external" parameters would have to be defined for the RNSAP. This would increase the complexity of the RNSAP. In addition, if several additional parameters of a protocol are to be defined for [the] another protocol, it makes these two different protocols very dependent on each other. The independent evolution of them would thus become more difficult to manage.

Paragraph beginning at page 16, line 9 has been amended as follows:

According to a further embodiment the initialization is a bi-directional process. In other words, instead of only transmitting information from the first network element (node) to the second element, the new network element may send a [respond] response to the first element or accomplish a transmission to a further network element. The [respond] response may include a message such as "unable to initialize", "overload", "all parameters not received" and so on. Upon receiving the response, the first network element may modify its state and/or take some other actions towards the new termination point. For example, transmit modified parameter or parameters, or use a different transmission route, or try to relocate the connection to another network element.

Paragraph beginning at page 16, line 31 through page 17, line 4 has been amended as follows:

There are also other possible reasons for initiating the relocation procedure [that] other than movement of the mobile station into a new service area. For example, the network element in question may become overloaded or a failure in the system of the network element itself may force the system to relocate at least a part of the functionalities[,]; for purposes of network optimization[,]; for purposes of load balancing, and so on.

In the Claims:

3. (Amended) A method according to claim 1 [or 2], wherein the first termination point is located at a first network element of the communication system and the

second termination point is located at a second network element of the communication system.

5. (Amended) A method according to [any of the preceding claims] claim 1, wherein the protocol initialization unit is encapsulated in a message transmitted between the first termination point and the second termination point by the second protocol.

6. (Amended) A method according to [any of the preceding claims] claim 1, wherein the protocol initialization unit is transparent for the second protocol.

7. (Amended) A method according to [any of the preceding claims] claim 1, wherein the protocol initialization unit is transmitted via a third network element between the termination points.

9. (Amended) A method according to [any of claims 1 to 6] claim 1, wherein the protocol initialization unit is transmitted by a direct connection between the termination points.

11. (Amended) A method according to [any of the preceding claims] claim 1, wherein the predefined information of the first protocol comprise one or several parameters

of a radio resource control protocol (RRC), medium access control protocol (MAC), radio link control protocol (RLC), and/or packet data convergence protocol (PDCP).

12. (Amended) A method according to [any of the preceding claims] claim 1, wherein the protocol initialization unit contains information of at least one further protocol.

13. (Amended) A method according to [any of the preceding claims] claim 1, comprising steps of:

defining at least one further protocol initialization unit containing predefined information of a further protocol by the further protocol; and

transferring the further protocol initialization unit from the first termination point to the second termination point.

14. (Amended) A method according to claim 13, wherein the further protocol initialization unit is transferred between the termination points by a protocol that is different [to] from the second protocol.

15. (Amended) A method according to [any of the preceding claims] claim 1, wherein at least one of the termination points is located at one of the following: a base station controller, a radio network controller, a base station, a gateway.

16. (Amended) A method according to [any of the preceding claims] claim 1, wherein the step of initializing the second termination point comprises setting the parameters of the second termination point into a state that is similar to the parameters of the first termination point before or at the time the relocation procedure was initiated.

19. (Amended) A communication system according to claim 17 [or claim 18], wherein the control means for relocating are arranged to encapsulate the protocol initialization unit into a message to be transmitted from the first termination point to the second termination point.

20. (Amended) A communication system according to [any of claims 17 to 19] claim 17, wherein the first termination point is located at a first network element of the communication system and the control means for relocating are arranged in connection with the first network element.

21. (Amended) A communication system according to [any of claims 17 to 20] claim 17, wherein the second termination point is located at a second network element of the communication system and the control means for initializing are arranged in connection with the second network element.

22. (Amended) A communication system according to [any of the claims 17 to 21] claim 17, wherein the protocol initialization unit contains information of at least one further protocol.

25. (Amended) A network element according to claim 23 [or claim 24], wherein the control means for relocating are arranged to encapsulate the protocol initialization unit into a message to be transmitted from the first termination point by means of the second protocol.

26. (Amended) A network element according to [any of claims 23 to 25] claim 23, wherein the protocol initialization unit contains information of at least one further protocol.

JOOOOI52 .06U502

(12) INTERNATIONAL APP . TION PUBLISHED UNDER THE PATENT (ERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 March 2001 (22.03.2001)

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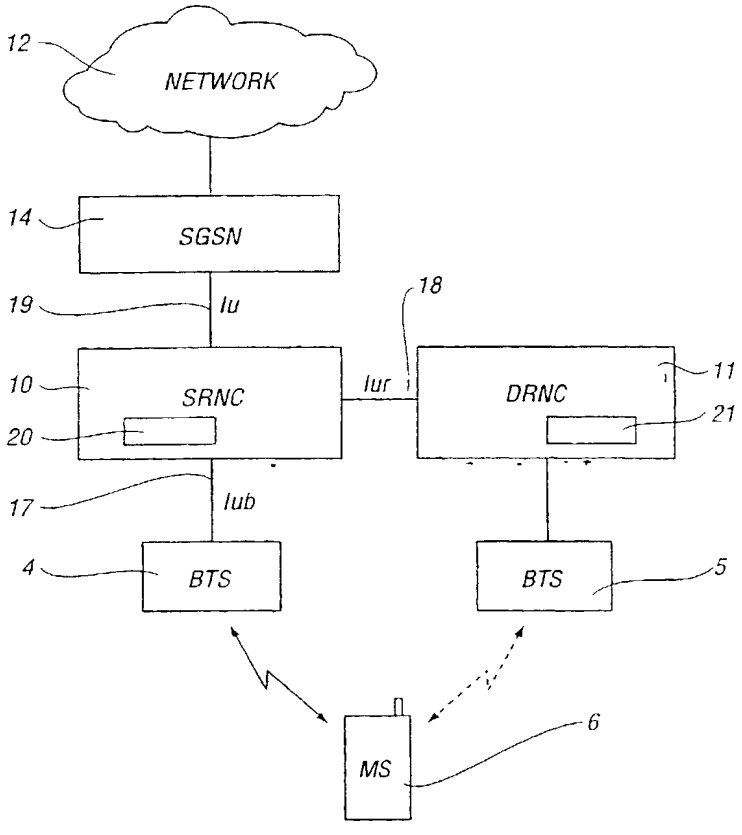
(54) Title: RELOCATION IN A COMMUNICATION SYSTEM



(57) Abstract: The present invnetion relates to relocation of a protocol termination point in a communication system comprising a first protocol termination point, a second protocol termination point and control means for relocating a first protocol from the first protocol termination point to the second protocol termination point. A protocol initialization unit that contains predefined information of the first termination point is defined by means of the first protocol. The protocol initialization unit is subsequently transferred from the first termination point to the second termination point by means of a second protocol. The second termination point is initialized based on the received protocol initialization unit

WO 01/20938 A1

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Relocation in a communication system

Field of the Invention

The present invention relates to relocation in a communication system and in particular, but not exclusively, to relocation of a protocol termination point.

Background of the Invention

Communication networks typically operate in accordance with a given standard which sets out what the elements of the network are permitted to do and how that should be achieved. The communication in the networks follows predefined rules which are referred to in the following as protocols. The protocols to be used are defined in the associated standard. The protocols can be used for controlling various events and functionalities in a connection provided through the communications network. Several protocols may be simultaneously in an active state for providing control of a connection. During an ongoing i.e. active connection a protocol is having a termination point in the network element controlling the connection. For example, a protocol may have termination points in a telephone terminal and in a network controller controlling the connection.

A communication network is a cellular radio network consisting of cells. In most cases the cell can be defined as a certain area covered by one or several base transceiver stations (BTS) serving mobile stations (MS) via a radio interface and connected to a base station subsystem (BSS). Several cells cover a larger area, and form the coverage area of a cellular

radio network. The cell (or group of cells) and thus the mobile station (MS) or similar user equipment (UE) within one of the cells of the system can be controlled by a node providing controller functionality, for example by a radio network controller (RNC) or a mobile switching center (MSC). The controller can be connected further to a gateway or linking node, for example a gateway GPRS support node (GGSN) or gateway mobile switching center (GSMC), linking the cell to the other parts of the communication system and/or other communication networks, such as to a PSTN (Public Switched Telecommunications Network) or to a data network, such as to a X.25 based network or to a TCP/IP (Transmission Control Protocol/Internet Protocol) based network.

The mobile station MS may be controlled by only one controller at time. However, the MS may also be simultaneously controlled by several controller nodes. This may occur e.g. when the cells overlap or in so called soft handoff mode, where the MS may be in communication with two base stations and those base stations may be connected to different controllers, or when one controller is controlling another controller controlling the MS. One controller of the plurality of controllers in the system can be defined as a serving (main) controller whereas the others may act as secondary controllers. The responsibility of controlling a connection between the mobile station and the network may change during an ongoing connection. It is therefore necessary to relocate at least part of functionalities associated with the connection such that the connection will not become disconnected and/or that the quality of the connection remains in an acceptable level. It is to be appreciated that in addition or as an alternative to relocating functionalities of the controller node, the

functionality to be relocated may also be located in any other of the network elements, for example in the base station, base station subsystem, in the gateway and so on.

When relocation is decided to be performed, the serving controller or another node of the communication system may initiate the necessary proceeding for replacing one or several of the network nodes with a new corresponding node or nodes.

In case of an active i.e. ongoing connection, one of the features that should to be relocated is the state of a protocol termination point. Although it is not always necessary, in a usual case the status of the protocol termination point at the new "replacing" network element or node should be such that it may take over the functions of the old "replaced" network node. At the present the parameters which need to be transferred have to be defined also in the protocols which are used to convey the information from the old termination point to the new termination point. For example, if parameters of a Radio Resource Control (RRC) or Medium Access Control (MAC) or Radio Link Control (RLC) protocols are to be relocated in a system that would use radio network subsystem application part (RNSAP) for communication between the network controller nodes, this would mean that a lot of "external" parameters would have to be defined for the RNSAP. This would increase the complexity of the RNSAP. In addition, if several additional parameters of a protocol are to be defined for the another protocol, it makes these two different protocols very dependent on each other. The independent evolution of them would thus become more difficult to manage.

Summary of the Invention

It is an aim of the embodiments of the present invention to address one or several of the above problems.

According to one aspect of the present invention, there is provided a method in a communication system for relocating a protocol termination point, comprising:

defining a protocol initialization unit containing predefined information of a first termination point of a first protocol by the first protocol;

transferring the protocol initialization unit from the first termination point to a second termination point by a second protocol; and

initializing the second termination point based on the protocol initialization unit.

According to another aspect of the present invention there is provided a communication system, comprising:

a first protocol termination point;

a second protocol termination point;

control means for relocating a first protocol from the first protocol termination point to the second protocol termination point, said control means being arranged to form a protocol initialization unit containing predefined information of the first protocol at the first protocol termination point;

communication path based on a second protocol between the first and the second termination points for transferring the protocol initialization unit; and

control means for initializing the second protocol termination point based on the protocol initialization unit.

According to a still another aspect of the present invention there is provided a network element for use in a communication network, comprising:

a protocol termination point;

control means for relocating a first protocol from the protocol termination point to another protocol termination point, said control means being arranged to form a protocol initialization unit containing predefined information of the first protocol at the protocol termination point; and

interface to said other protocol termination point based on a second protocol for transferring the protocol initialization unit from the first termination point by means of the second protocol.

According to a still another aspect of the present invention there is provided a network element for use in a communication network, comprising:

a protocol termination point of a first protocol;

interface to another protocol termination point for receiving a protocol initialization unit containing predefined information of the first protocol at said other termination point, wherein the interface is based on a second protocol; and

control means for initializing the protocol termination point based on the received protocol initialization unit.

According to a more specific embodiment, the protocol initialization unit may contain state information of the first protocol termination point.

The first termination point may also be located at a first network element of the communication system and the second

termination point may be located at a second network element of the communication system. The second network element may, upon receiving the protocol information unit, generate and transmit a response to the first network element by means of the second protocol.

The protocol initialization unit may be encapsulated in a message transmitted between the first termination point and the second termination point. The protocol initialization unit may also be transparent for the second protocol.

The protocol initialization unit may be transmitted via a network element of a core network of the communication system. This may be accomplished by means of a radio access network application part (RANAP) protocol. According to an embodiment, the protocol initialization unit may be transmitted directly between the termination points. This may be accomplished by means of a radio network subsystem application part (RNSAP) protocol.

The protocol initialization unit may contain information of at least one further protocol. According to an embodiment at least one further protocol initialization unit may be defined containing predefined information of a further protocol by the further protocol, whereafter the further protocol initialization unit is transferred from the first termination point to the second termination point. The further protocol initialization unit may be transferred between the termination points by a protocol that is different to the second protocol.

The parameters of the second termination point may be set into a state that is relatively similar to the state of parameters

of the first termination point before or at the time the relocation procedure was initiated during the initialization procedure.

The embodiments of the invention provide several advantages. One of the benefits is that a need for defining a great number of parameters of one protocol in another protocol is avoided. This provides clear benefits in updating and maintenance of the protocols.

Brief Description of Drawings

For better understanding of the present invention, reference will now be made by way of example to the accompanying drawings in which:

Figure 1 shows a schematic diagram of a cellular radio network system in which embodiments of the invention can be implemented;

Figure 2 shows the hierarchy of various elements of the network of Figure 1;

Figure 3 shows two possible interfaces between network nodes; and

Figure 4 is a flow chart for operation in accordance with one embodiment.

Description of Preferred Embodiments of the Invention

Reference will be first made to Figure 1 in which three cells 1,2,3 of a cellular telecommunications network are shown. Each cell 1,2,3 is served by a respective base transceiver station (BTS) 4',4,5. Each base transceiver station (BTS) is arranged to transmit signals to and receive signals from the mobile

stations (MS) 6 located in the cell associated with the given base transceiver station. Likewise, each mobile station 6 is able to transmit signals to and receive signals from the respective base transceiver station 4',4,5, and also able to move from the coverage area of one cell to the coverage area of another cell, e.g. from cell 2 to cell 3.

The exemplifying cellular telecommunications network will be described in more detail in the following by using the terminology of a proposed Universal Mobile Telecommunications System (UMTS) standard. However, it is to be appreciated that the invention is not restricted to UMTS but can be implemented in any standard. Examples of these include, without any intention to restrict the possible communication systems to these, any of the code division multiple access (CDMA) based systems or any of the time division multiple access (TDMA) based systems or any of the frequency division multiple access (FDMA) based systems or any hybrids thereof.

Reference is now made to Figure 2 which shows the hierarchy of a cellular communication system. As can be seen, the mobile station 6 is in wireless communication with one of the base stations. Typically a number of mobile stations will be in communication with each base station although only one mobile station is shown in Figure 2 for clarity. A first base station 4 is connected to a first network controller, which in Figure 2 is a serving radio network controller SRNC 10. Again, more than one base station is usually connected to each controller 10 although only one is shown for clarity. Typically more than one controller is also provided in a network. The SRNC 10 is connected to other elements of the network 12 via a suitable

linking or gateway apparatus, such as a serving GPRS (General Packet radio Service) Support Node (SGSN) 14.

The SRNC 10 is arranged to control the base station, either directly or through an intermediate node (not shown). The controller 10 passes on data to be transmitted to the mobile station by the base station. The controller 10 will also receive from the base station data which the base station has received from the mobile station. The implementation of the communication between the base station, the mobile station and the controller is known, and will thus not be discussed in detail herein. It is sufficient to note that the interface may comprise channels in both uplink and downlink directions. The data may be sent between the mobile station and the controller in any suitable format. The messages sent from the mobile stations may include information identifying the mobile station (for instance, MS ID and/or IMSI (Mobile Station Identity and/or International Mobile Subscriber Identity, respectively)).

In addition to the serving controller (RNC 10), the cellular telecommunications system of Figure 2 includes another controller RNC 11 controlling the base station 5 of cell 3 of Figure 2. It is, again, noted that the second controller may also control more than one base station. The second controller may also sometimes be referred to as a drift controller (DRNC). The SNRC 10 and DRNC 11 may communicate with each other over an open Iur interface 18 established between them.

Figure 2 illustrates one possible relocation situation wherein the mobile station MS 6 or similar user equipment communicates firstly via the BTS 4 over a radio interface designated by a

solid line and then switches to communicate via a new BTS 5, as designated by the dashed radio interface. According to one possibility the change from one base station to another may occur after the mobile station 6 has moved into the service or illumination area of the second base station 5. However, it is to be appreciated that in addition to the movement of the mobile station, there are also other possible reasons for triggering the relocation of the connection to another base station or to another network element, such as network optimization, load balancing, hardware congestion, connection quality improvement, fault in the system or base station and so on.

In order to ensure a proper operation of the system and to avoid disconnecting a possibly ongoing call, at least some of the functionalities of the network elements have to be relocated for the connection. For example, when a SRNC functionality is to be located from a first RNC to a second RNC some protocol termination points of an ongoing connection (such as RRC, RCL and/or MAC protocols) need to be changed from the first RNC to the second RNC.

Before explaining an embodiment for the relocation in more detail, a brief explanation will given of the protocol termination point with reference to Figure 3 showing a block diagram of the source RNC 10 and the target RNC 11. The exemplifying protocol termination point is illustrated to comprise a radio resource control (RRC) protocol. However, it is to be appreciated that the described RRC protocol is only an example, and that the embodiments can be implemented for any other protocol used for a connection in a communication system as well. These other protocols include, without any

restriction to these, medium access control (MAC) protocol, radio link control (RLC) protocol and packet data convergence protocol (PDCP).

The SRNC 10 and DRNC 11 each are provided with a Radio Resource Controller functionality RRC 24 and 26, respectively. When the MS 6 is communication with the controller 10, the RRC protocol has its other termination point correspondingly at the controller 10, while the other termination point is at the mobile station. However, should the controller change, the termination point of the RRC protocol should also be changed correspondingly. More precisely, the new controller 11 should be provided with a similar termination point functionality using similar parameters as the previous controller had. These functionalities will be controlled by a control unit 20 at the source controller 10 and by a control unit 21 at the target controller 11.

Figure 3 shows further an Iur interface 18 between the DRNC 10 and the SRNC 11. For example, a RNSAP (Radio Network Subsystem Application Part) protocol can be used for the direct signalling between the two RNCs. A RANAP (Radio Access Network Application Part; in the control plane) protocol can used for L3 (Layer 3) signalling over the Iu interface between the RNCs and an appropriate element 14 of the core network 14. The core network element 14 can be e.g. a mobile switching center or a serving GPRS support node.

A reference will now be made to the flow chart of Figure 4 showing in more detail an embodiment for moving the required state information of a protocol termination point from one termination point at a first network element (NE) to another

termination point in a second network element. As illustrated by step 30, the protocol termination point is to be moved between the termination points during an active state of the protocol between the servicing network controller and the mobile station. After the relocation procedures are initiated at step 32, the "old" protocol termination point in the source network element produces at step 34 a special protocol data unit (PDU) containing predefined necessary protocol parameters for initialization of the second termination point before relocation of the connection. The PDU is passed at step 36 to the new termination point with help of a second protocol. The second protocol is used for signaling between the different network elements or nodes. The passed information can be transparent to the second protocol used for the transmission of the PDU. Examples of the protocols which may be used for the transmission of the PDU will be discussed in more detail later in this specification. The new termination point receives the PDU and it is initialized at step 38 based on the information received from the old termination point. After the initialization procedure the termination point will be relocated at step 40 to the new network element and the operation of the system continues as before except that the protocol termination point of the active protocol is now situated in the new network element.

In other words, an explicit protocol message will be passed between the old termination point and the new termination point of a protocol in case of relocation of the protocol termination point. The specified PDU (or message) is used within a protocol peer between the old and the new termination point of the protocol. In a preferred embodiment a single protocol defines the information to be transferred between the

protocol peers and the information to be transmitted within one peer. By means of this it is possible to avoid a need for defining a great number of parameters of one protocol in another protocol. For example, by the embodiment described in the following about 100 RRC parameters in the RANAP protocol are avoided.

Referring again to Figure 3, a more detailed example of the relocation procedure will now be given in context of relocating a radio interface L3 protocol (i.e. a radio resource control; RRC) protocol from a first or source controller (e.g. RNC 10 of Figure 3) to a second or target controller (e.g. RNC 11 of Figure 3). The exemplifying RRC protocol is known, and is not described in more detail. It is sufficient to note that the RRC provides common controlling and signaling over the air interface between the serving RNC and the mobile station and that the RRC can be shared with circuit switched traffic and packet switched traffic.

The control unit 20 of the first (source) RNC 10 produces the special protocol initialization unit which in this instance will be referred to as a RRC PDU. The RRC PDU contains all such predefined RRC parameters that have to be known by the new termination point in order to receive and continue the connection. These parameters may include information concerning e.g. one or several of the following: radio bearer(s), transport channel(s), radio link(s) and their physical channels, capability information as well as user equipment capabilities and measurements being reported by the user equipment and so on. According to a preferred embodiment the RRC PDU contains all such RRC parameters that are required by the termination point at the target RNC to start the RRC

protocol in a relatively similar state and conditions that existed in the old termination point.

According to an embodiment the generated RRC PDU can be transferred from the first RNC to the second RNC by means of a RNSAP (Radio Network Subsystem Application Part) over an open interface Iur 18 provided between the first controller 10 and the second controller 11. The termination point at the second RNC receives the RRC PDU and subsequently decodes the received RRC PDU. The termination point 26 is initialized based on the received and decoded information. The initialization procedure can be controlled by the control unit 21.

According to another embodiment the PDU is firstly moved from the source RNC 10 to the core network (CN) 14 over an Iu interface 19 by a RANAP (Radio Access Network Application Part) message 'RELOCATION REQUIRED' and subsequently from the core network to the target RNC 11 by an Iu RANAP message 'RELOCATION REQUEST'.

The RRC PDU can be encapsulated within a message in the second protocol as there is no need for the contents of the RRC PDU to be visible for the functionality of the second protocol, such as to the RANAP or the RNSAP. The encapsulation of protocol messages transparently to a message of another protocol is a known technique and will thus not be discussed in more detail herein

It should be appreciated that the status of any other protocol, such as the MAC protocol or RLC protocol referred to above, could also be conveyed by the RRC protocol. In more general terms, a protocol may "collect" required information

for several protocols and generate a PDU containing required information for all or at least more than one of the protocols to be relocated. According to an embodiment a separate or further protocol initialization unit PDU is used for each of the protocols to be relocated or at least some of the protocols to be relocated. The different protocol initialization units can be transferred between the termination point by protocols that are different to each other.

It should also be appreciated that some embodiments do not require an identical or relatively similar protocol termination point at the old and the new network element. However, it is preferred that the information included in the protocol initialization unit is such that that the functionalities of the communication system may continue without disconnecting the user equipment from the communication system.

According to one possibility the termination point is not relocated from a network element or node to another node but within the node.

It is noted that in some embodiments of the invention, the relocation of some or all functionalities may also be triggered even in such conditions where the communication could continue without any relocation proceedings, e.g. in order to optimize the operation of the system or balance the load distribution in the system. In addition, the mobile station 6 of Figure 2 may be in communication with both controllers 10 and 11. Furthermore, it may not be necessary to relocate the entire protocol or all protocols used for a

connection, but instead only a part of the information concerning the protocols is transmitted between the network elements. For example, a user plane communication may be enabled via the Iur interface 18 of Figure 2, whereby the mobile station 6 within the service area of the controller 11 could still be controlled by the old servicing controller 10 via the controller 11.

According to a further embodiment the initialization is a bi-directional process. In other words, instead of only transmitting information from the first network element (node) to the second element, the new network element may send a respond to the first element or accomplish a transmission to a further network element. The respond may include a message such as "unable to initialize", "overload", "all parameters not received" and so on. Upon receiving the response, the first network element may modify its state and/or take some other actions towards the new termination point. For example, transmit modified parameter or parameters, or use different transmission route, or try to relocate the connection to another network element.

It should also be appreciated that whilst embodiments of the present invention have been described in relation to a connection between the network nodes and a mobile station, embodiments of the present invention are applicable to any other suitable type of connections terminating to one node. It should also be appreciated that base stations can sometimes be referred to as node B.

There are also other possible reasons for initiating the relocation procedure that movement of the mobile station into a new service area. For example, the network element in

question may become overloaded or a failure in the system of the network element itself may force the system to relocate at least a part of the functionalities, network optimization, load balancing and so on.

The exemplifying embodiments of the invention have discussed protocols terminated to a network controller. Embodiments of the present invention can be applicable to other network elements as well where applicable.

It is also noted herein that while the above describes one exemplifying embodiment of the invention, there are several variations and modifications which may be made to the disclosed solution without departing from the scope of the present invention as defined in the appended claims.

Claims

1. A method in a communication system for relocating a protocol termination point, comprising:

defining a protocol initialization unit containing predefined information of a first termination point of a first protocol by the first protocol;

transferring the protocol initialization unit from the first termination point to a second termination point by a second protocol; and

initializing the second termination point based on the protocol initialization unit.

2. A method according to claim 1, wherein the protocol initialization unit contains state information of the first protocol termination point.

3. A method according to claim 1 or 2, wherein the first termination point is located at a first network element of the communication system and the second termination point is located at a second network element of the communication system.

4. A method according to claim 3, wherein the second network element, upon receiving the protocol information unit, generates and transmits a response to the first network element by means of the second protocol.

5. A method according to any of the preceding claims, wherein the protocol initialization unit is encapsulated in a message transmitted between the first termination point and the second termination point by the second protocol.

6. A method according to any of the preceding claims, wherein the protocol initialization unit is transparent for the second protocol.

7. A method according to any of the preceding claims, wherein the protocol initialization unit is transmitted via a third network element between the termination points.

8. A method according to claim 7, wherein the transmission is based on a radio access network application part (RANAP) protocol.

9. A method according to any of claims 1 to 6, wherein the protocol initialization unit is transmitted by a direct connection between the termination points.

10. A method according to claim 9, wherein the transmission is based on a radio network subsystem application part (RNSAP) protocol.

11. A method according to any of the preceding claims, wherein the predefined information of the first protocol comprise one or several parameters of a radio resource control protocol (RRC), medium access control protocol (MAC), radio link control protocol (RLC), and/or packet data convergence protocol (PDCP).

12. A method according to any of the preceding claims, wherein the protocol initialization unit contains information of at least one further protocol.

13. A method according to any of the preceding claims, comprising steps of:

defining at least one further protocol initialization unit containing predefined information of a further protocol by the further protocol; and

transferring the further protocol initialization unit from the first termination point to the second termination point.

14. A method according to claim 13, wherein the further protocol initialization unit is transferred between the termination points by a protocol that is different to the second protocol.

15. A method according to any of the preceding claims, wherein at least one of the termination points is located at one of the following: a base station controller, a radio network controller, a base station, a gateway.

16. A method according to any of the preceding claims, wherein the step of initializing the second termination point comprises setting the parameters of the second termination point into a state that is similar to the parameters of the first termination point before or at the time the relocation procedure was initiated.

17. A communication system, comprising:

a first protocol termination point;

a second protocol termination point;

control means for relocating a first protocol from the first protocol termination point to the second protocol termination point, said control means being arranged to form a

protocol initialization unit containing predefined information of the first protocol at the first protocol termination point;

communication path based on a second protocol between the first and the second termination points for transferring the protocol initialization unit; and

control means for initializing the second protocol termination point based on the protocol initialization unit.

18. A communication system according to claim 17, wherein the protocol initialization unit contains state information of the first protocol termination point.

19. A communication system according to claim 17 or 18, wherein the control means for relocating are arranged to encapsulate the protocol initialization unit into a message to be transmitted from the first termination point to the second termination point.

20. A communication system according to any of claims 17 to 19, wherein the first termination point is located at a first network element of the communication system and the control means for relocating are arranged in connection with the first network element.

21. A communication system according to any of claims 17 to 20, wherein the second termination point is located at a second network element of the communication system and the control means for initializing are arranged in connection with the second network element.

22. A communication system according to any of the claims 17 to 21, wherein the protocol initialization unit contains information of at least one further protocol.

23. A network element for use in a communication network, comprising:

a protocol termination point;

control means for relocating a first protocol from the protocol termination point to another protocol termination point, said control means being arranged to form a protocol initialization unit containing predefined information of the first protocol at the protocol termination point; and

interface to said other protocol termination point based on a second protocol for transferring the protocol initialization unit from the first termination point by means of the second protocol.

24. A network element according to claim 23, wherein the network element comprises a controller of a cellular communication network.

25. A network element according to claim 23 or 24, wherein the control means for relocating are arranged to encapsulate the protocol initialization unit into a message to be transmitted from the first termination point by means of the second protocol.

26. A network element according to any of claims 23 to 25, wherein the protocol initialization unit contains information of at least one further protocol.

27. A network element for use in a communication network, comprising:

a protocol termination point of a first protocol;

interface to another protocol termination point for receiving a protocol initialization unit containing predefined information of the first protocol at said other termination point, wherein the interface is based on a second protocol; and

control means for initializing the protocol termination point based on the received protocol initialization unit.

28. A network element according to claim 27, wherein the network element comprises a controller of a cellular communication network.

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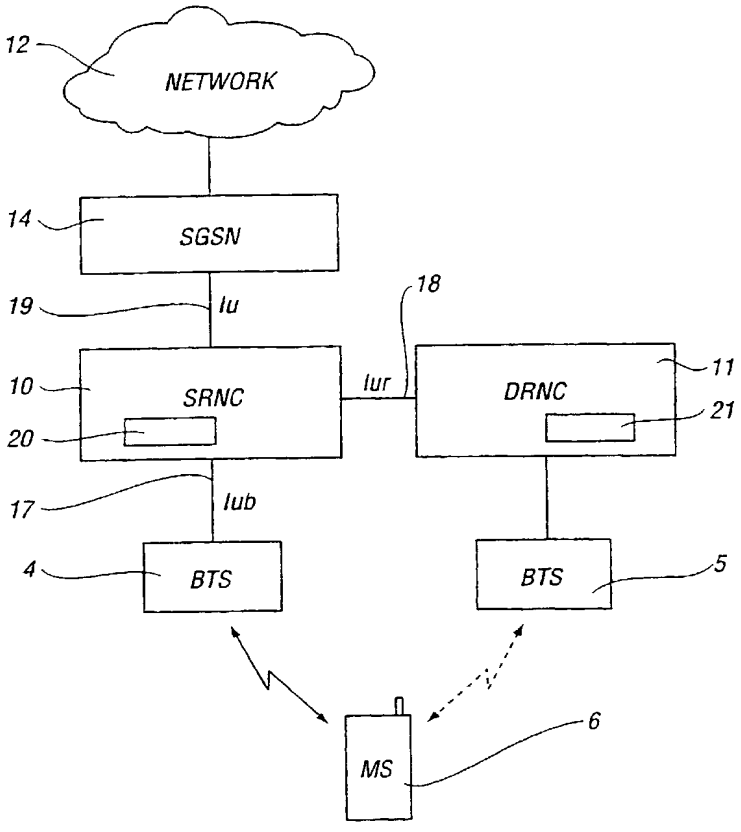


(57) Abstract: The present invnetion relates to relocation of a protocol termination point in a communication system comprising a first protocol termination point, a second protocol termination point and control means for relocating a first protocol from the first protocol termination point to the second protocol termination point. A protocol initialization unit that contains predefined information of the first termination point is defined by means of the first protocol. The protocol initialization unit is subsequently transferred from the first termination point to the second termination point by means of a second protocol. The second termination point is initialized based on the received protocol initialization unit.

WO 01/20938 A1

1/3

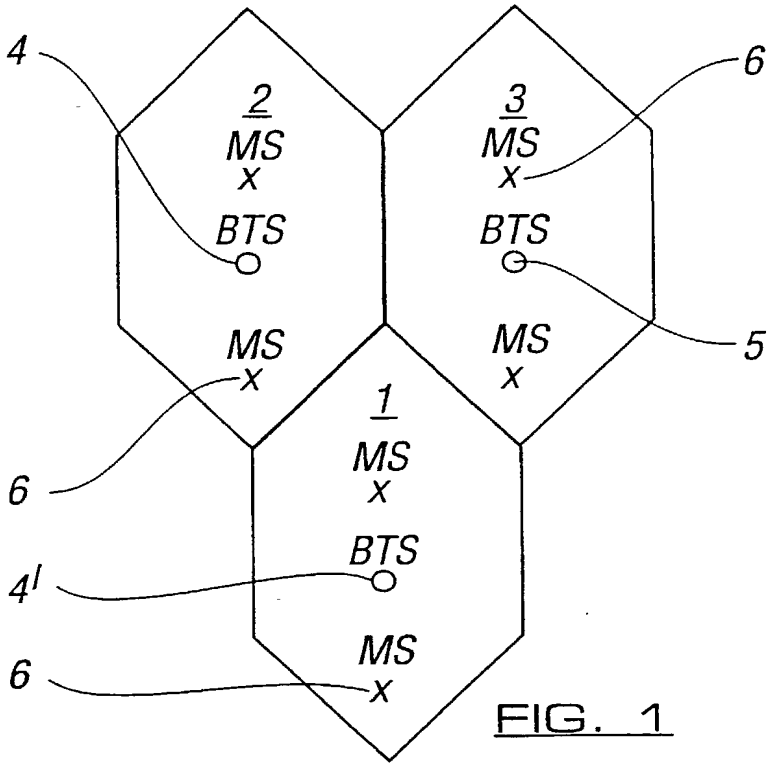

4
2
MS
BTS
MS
6
3
MS
BTS
MS
5
6
1
MS
BTS
4'
MS
6

FIG. 1

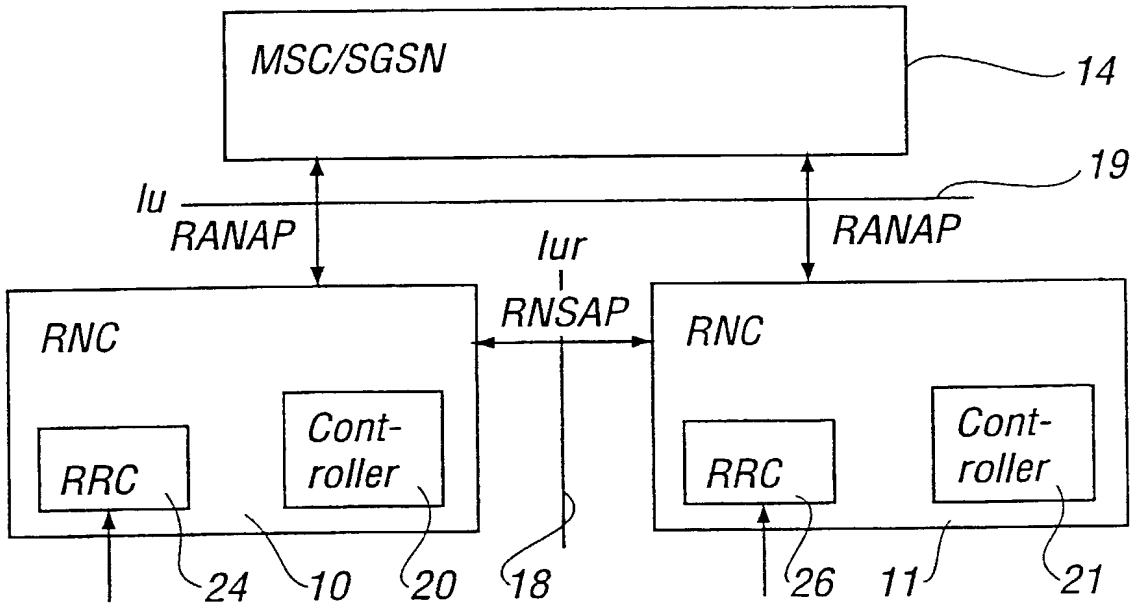

MSC/SGSN
14
19
Iu
RANAP
RANAP
Iur
RNSAP
RNC
RRC
Cont-
roller
RNC
RRC
Cont-
roller
24
10
20
18
26
11
21

FIG. 3

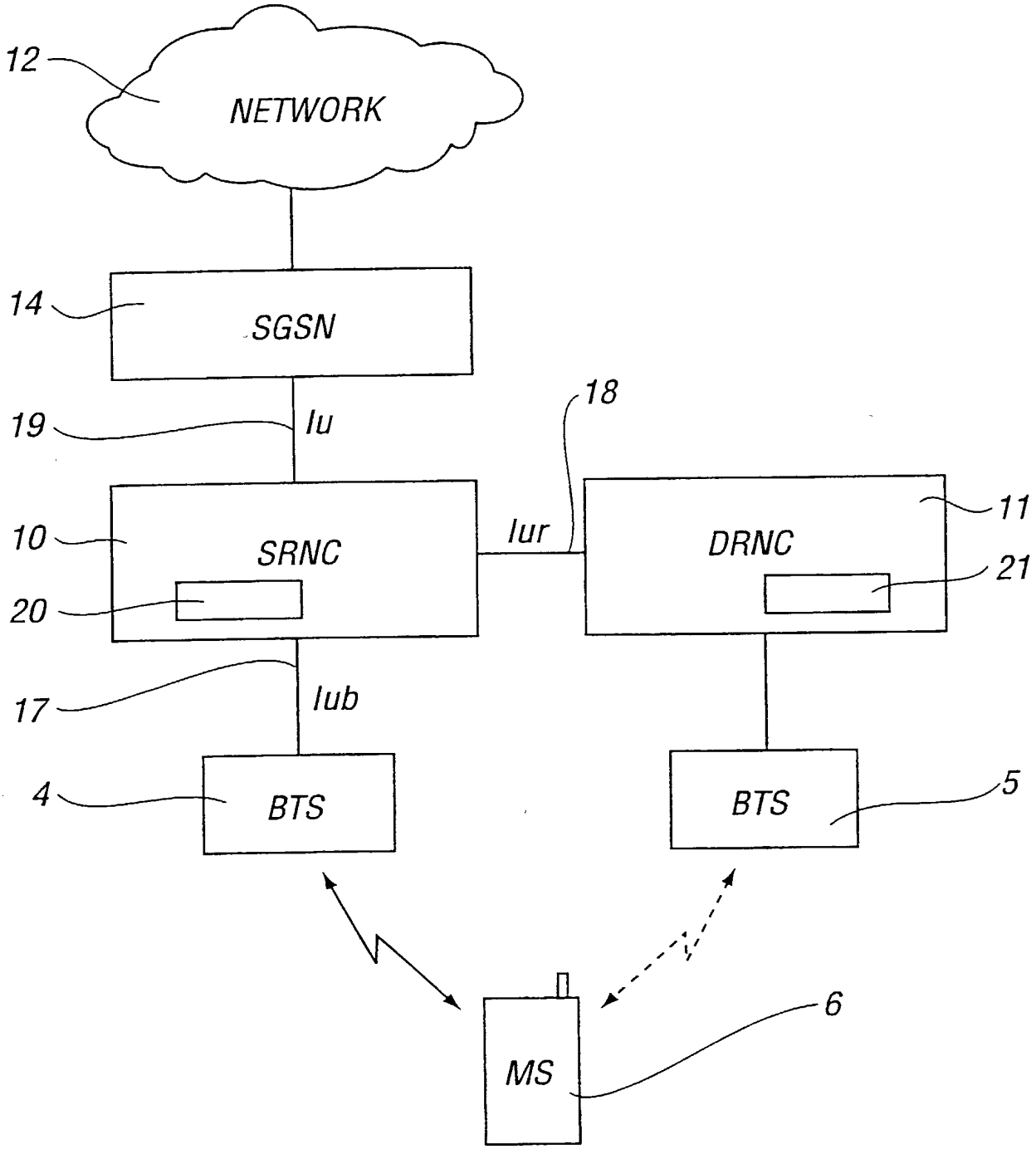

12
NETWORK
14
SGSN
19
Iu
18
10
SRNC
Iur
DRNC
11
20
21
17
Iub
4
BTS
BTS
5
MS
6

FIG. 2

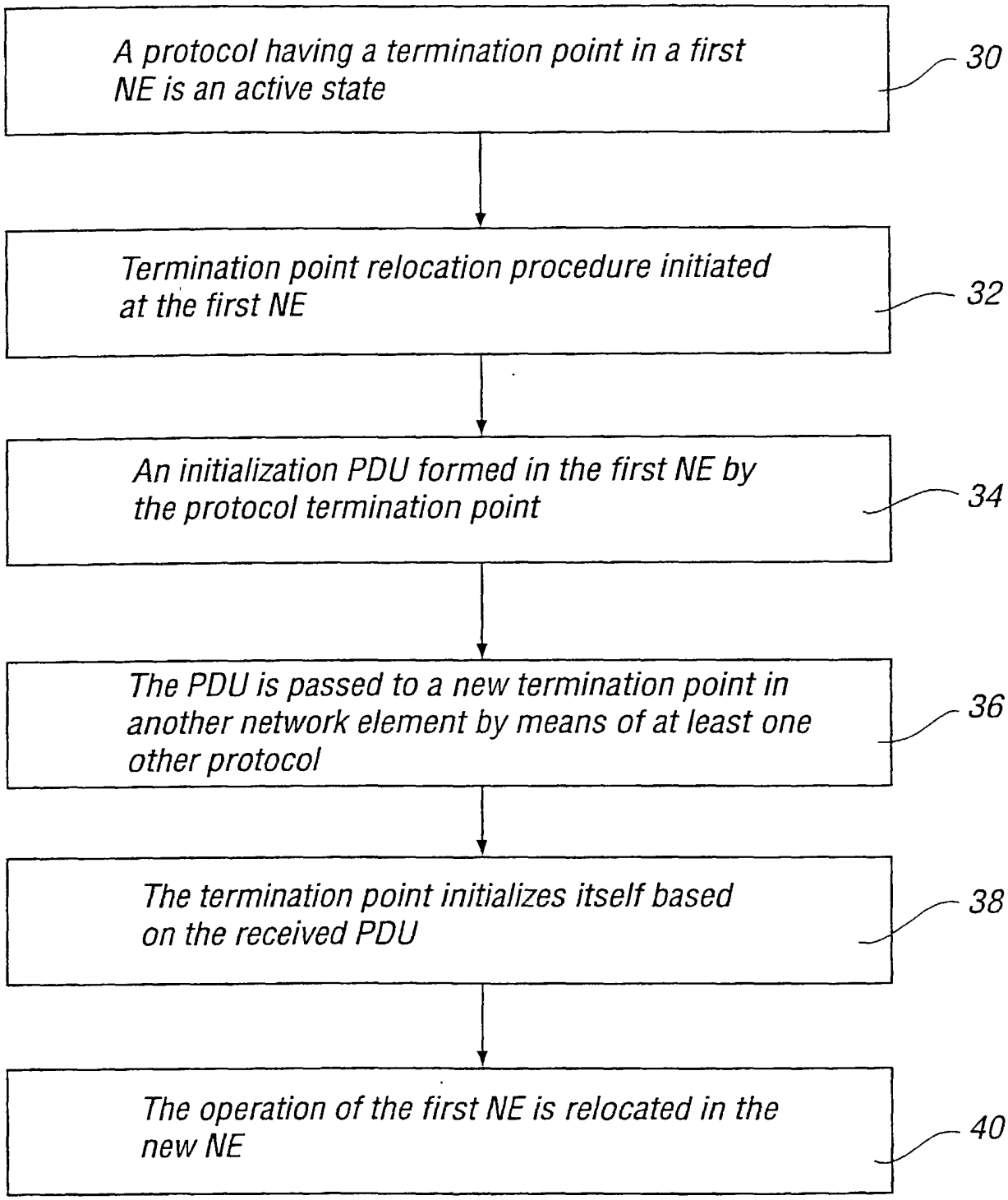

A protocol having a termination point in a first NE is an active state
30
Termination point relocation procedure initiated at the first NE
32
An initialization PDU formed in the first NE by the protocol termination point
34
The PDU is passed to a new termination point in another network element by means of at least one other protocol
36
The termination point initializes itself based on the received PDU
38
The operation of the first NE is relocated in the new NE
40

FIG. 4

COMBINED DECLARATION AND POWER OF ATTORNEY

(Docket Number)

As a below named inventor, I hereby declare that: 915-003.5

- my residence, post office address and citizenship are as stated below next to my name;
- I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: RELOCATION IN A COMMUNICATION SYSTEM
- the specification of which is attached hereto unless the following box is checked: ☒. If the box is checked,

the application was filed on March 14, 2002
as U.S Application Number 10/088,452
or PCT International Application Number
and was amended on (if applicable). March 14, 2002

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR §1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application			Priority Not Claimed
PCT/EP00/09100 (Application Number)	EP (Country)	13 Sept 2000 (Day/Month/Year Filed)	☐
GB9921706.9 (Application Number)	Great Britain (Country)	14 Sept 1999 (Day/Month/Year Filed)	☐

To the extent permitted by rule or law, I hereby incorporate by reference the Prior Foreign Application(s) listed above.

I hereby claim the benefits under 35 U.S.C. §119(e) of any United States provisional application(s) listed below:

(Provisional Application Number)	(Day/Month/Year Filed)
(Provisional Application Number)	(Day/Month/Year Filed)

I hereby claim the benefit under 35 U.S.C. §120 of any United States application(s), or §365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. §112, I acknowledge the duty to disclose information which is material to patentability, as defined in 37 CFR §1.56, which became available between the filing date of the prior application and the national or PCT International filing date of this application.

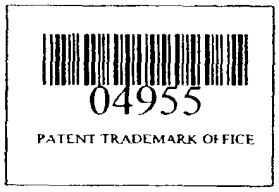
(Application Number)	(Day/Month/Year Filed)	(Status--patented, pending, abandoned)
(Application Number)	(Day/Month/Year Filed)	(Status--patented, pending, abandoned)

The undersigned hereby authorizes the U S. firm of **Ware, Fressola, Van Der Sluys & Adolphson LLP** to accept and follow instructions from the English firm of **Page White & Farrer** as to any action to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. firm and the undersigned. In the event of a change in the persons from whom instructions may be taken, the U.S. firm will be so notified by the undersigned.

I hereby appoint the attorney(s) and/or agent(s) assigned to the customer number listed below, as may from time to time be amended, belonging to the U.S firm of **Ware, Fressola, Van Der Sluys & Adolphson LLP**, to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Customer Number

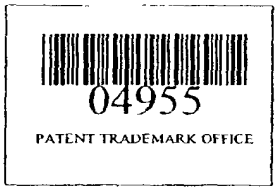
4955



Address all telephone calls to: Ware, Fressola, Van Der Sluys & Adolphson LLP at (203) 261-1234 **Address all correspondence to:** Alfred A. Fressola

Customer Number

4955



I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1 - ∞

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02320 Espoo, Finland FIX Residence	Finnish Citizenship
Post Office Address: Merivirta 6 A 16, 02320 Espoo, Finland	

Full name of second inventor (given name, middle initial, FAMILY NAME(S) IN UPPER CASE)	
Inventor's Signature	Date
Residence	Citizenship
Post Office Address:	

Full name of third inventor (given name, middle initial, FAMILY NAME(S) IN UPPER CASE)	
Inventor's Signature	Date
Residence	Citizenship
Post Office Address:	

☐ Additional inventors are being named on separately numbered sheets attached hereto.